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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,463	06/20/2001	Dov Ingman	50761.010100	9653

22191 7590 04/07/2004

GREENBERG-TRAURIG
1750 TYSONS BOULEVARD, 12TH FLOOR
MCLEAN, VA 22102

EXAMINER	
KANG, JULIANA K	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/884,463	INGMAN ET AL.	
	Examiner	Art Unit	
	Juliana K. Kang	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,14-35 and 38-43* is/are rejected.

7)☒ Claim(s) *12,13,36 and 37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Applicant's communication filed on 12/19/03 has been carefully studied by the Examiner. Applicant's arguments with respect to claims 1-43 have been considered but are moot in view of the new ground(s) of rejection. This action is not made final.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1, 2, 4, 6-9, 11, 14, 16, 17, 19, 20, 31, 33-35, 38, 41 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsubaki et al (U.S. Patent 5,790,742).**

Regarding claims 1, 6, 7, and 33, Tsubaki et al disclose an optical fiber comprising a core made of quartz glass (silica glass, see column 4 line 67); and a cladding layer including silica nano-particles around the core wherein the silica particles are hydrophobic particles (see column 5 lines 5-15).

Regarding claim 8, since claim 8 only further limits the metallic oxide which is one of the cladding layer nano-particles wherein the nano-particles can also be silica nano-particles, the claimed limitations are essentially disclosed by Tsubaki et al.

Regarding claims 2, 17, and 42 Tsubaki et al disclose the cladding layer comprising a filler (air, see column 5 line 54).

Regarding claim 4, Tsubaki et al disclose an over clad layer (5, see column 6 lines 26-28).

Regarding claim 14, Tsubaki et al disclose that the cladding layer (nano-particles having air) can be made of resins (see column 6 line 24).

Regarding claims 16 and 20, Tsubaki et al disclose an optical fiber bundle comprising: a plurality of cores (1); and a cladding layer (2 or 2b) including a silica nano-particles, wherein the plurality of cores are embedded within the same cladding layer (see Fig. 6D and see Fig. 10c).

Regarding claims 19, 34, Tsubaki et al further disclose an overclad layer (5) around the cladding layer (see Fig. 6D and see Fig. 10c).

Regarding claims 9 and 31, Tsubaki et al disclose the cladding layer can be made of other materials including silicone resins (see column 6 liens 20-25). Silicon resin surface has a hydrophilic property—OH group exists in the surface.

Regarding claims 11 and 35, Tsubaki et al disclose that the cladding layer can be made of a plurality of clad layers wherein the inner clad is made of silica aerogel comprising air and the outer clad can be made of silica aerogel (see column 5 lines 52-65). Thus, inner clad made of silica aerogel with air and the outer clad made of just silica aerogel would inherently have different or dissimilar hydrophobicity characteristics.

Regarding claims 38 and 41, Tsubaki et al disclose the claimed method limitations (see column 5 lines 32-39).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 3, 5, 15, 18, 22-30 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubaki et al (U.S. Patent 5,790,742).**

Regarding claims 3, 18, 24 and 28, as described above, Tsubaki et al disclose the cladding layer including silica nano-particles comprising air which provides more flexibility (see column 5 lines 57-59). Claimed materials such as polymer, synthetic oil, poly-siloxane and Teflon are well known materials used for the optical fiber cladding or coating layer to increase the flexibility of the optical fiber. Thus, one with ordinary skill in the art would have easily recognize the use of other materials such as polymer, synthetic oil, poly-siloxane and Teflon in Tsubaki et al to improve the flexibility of the optical fiber.

Regarding claim 5, as described above Tsubaki et al disclose the overclad layer. However, Tsubaki et al do not specifically teach Teflon. Tsubaki et al teach that overclad material is not particularly limited to any specific material (see column 6 lines 26-36). Teflon is a well-known material used in an optical fiber art as a coating material. Thus, it would have been obvious to one with ordinary skill in the art at the time the invention was made to use a well known coating material such as Teflon in Tsubaki et al

since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

Regarding claims 15, using thixotropic material is well known in the art to block moisture. Tsubaki et al's cladding layer prohibits moisture or water to enter and Tsubaki et al further teach that the material used for the clad layer is not limited to any particular material. Thus it would have been obvious to one with ordinary skill in the art to use any type of moisture blocking material including thixotropic material in Tsubaki et al as long as the cladding layer blocks moisture.

Regarding claims 22, 25, 26, 29, 30 and 43, described above, Tsubaki et al disclose the claimed invention including the silica nano-particles comprising air which provides a lowered Young's modulus (flexibility, see column 5 lines 51-59). However, Tsubaki et al do not teach a substrate. Placing an optical fiber on a substrate is well known in the art to secure or to support an optical fiber. Thus, it would have been obvious to one with ordinary skill in the art at the time the invention was made to place Tsubaki et al's optical fiber on a substrate to either secure or support the optical fiber for further coupling with other optical elements. Tsubaki et al disclose having a plurality of stacked cores (Fig. 6D) thus having a plurality of stacked waveguides on a substrate would also have been obvious to one with ordinary skill in the art.

Regarding claims 23 and 27, Tsubaki et al teach the cladding layer comprising a filler (air, see column 5 line 54).

6. **Claims 10, 21 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubaki et al (U.S. Patent 5,790,742) further in view of Arroyo et al (U.S. Patent 5,373,100).**

As described above Tsubaki et al disclose the cladding layer made of hydrophobic nano-particles for moisture resistance. However Tsubaki et al do not teach the nano-particles are a mixture of hydrophilic and hydrophobic. Arroyo et al teach using both hydrophilic and hydrophobic materials in an optical fiber cable to prevent water penetration along the cable. Thus, it would have been obvious to one with ordinary skill in the art to use a mixture of hydrophilic and hydrophobic materials in Tsubaki et al's cladding layer as taught by Arroyo et al to provide even better protection from the moisture or water.

7. **Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over** Tsubaki et al **as applied to claim 33 above, and further in view of Kanda et al (U.S. Patent 4,740,055).**

As described above, Tsubaki et al disclose coating an optical fiber core with nano-particles. However, Tsubaki et al do not positively teach the claimed coating methods. Kanda et al teach coating an optical fiber with polymer particles having particle sizes of 10nm to 6000nm (see column 3 line 1) wherein the particles are prepared using an azeotropic distillation (drying) method (see column 2 lines 42-48). Thus, it would have been obvious to one with ordinary skill in the art at the time the invention was made to use any particle coating method including Kanda et al's

azeotropic distillation method in Tsubaki et al in order to coat the fiber core with nano-particles.

8. **Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubaki et al as applied to claim 33 above, and further in view of Kanda et al (U.S. Patent 4,740,055).**

Tsubaki et al disclose coating an optical fiber core with nano-particles. However, Tsubaki et al do not positively teach the method step of drawing. Freidinger et al teach coating an optical fiber by drawing a coating material in the form of paste. Thus, it would have been obvious to one with ordinary skill in the art at the time the invention was made to use any coating methods including a drawing method in Tsubaki et al as taught by Freidinger et al to coat an optical fiber with a coating material.

9. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubaki et al as applied to claim 33 above, and further in view of Minemoto et al (U.S. Patent 5,699,461).

As described above, Tsubaki et al disclose coating an optical fiber core with nano-particles. However, Tsubaki et al do not positively recite claimed coating methods. Minemoto et al teach coating the fiber by applying the optical fiber with a polymer paste (filler) comprising fine particles and than drying (see column 13 lines 46-54). Thus, it would have been obvious to one with ordinary skill in the art to use any coating method including the method of applying and drying in Tsubaki et al as taught by Minemoto et al to coat the fiber with polymer that includes fine particles.

Allowable Subject Matter

10. Claims 12, 13, 36 and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The statement of reasons for the indication of allowable subject matter for claims 12, 13, 36 and 37 is stated in the previous Office action.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Okibayashi et al (U.S. Patent 5,589,732) teach that the silicon resin surface has a hydrophilic property (see column 2 lines 35-49).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juliana K. Kang whose telephone number is (571) 272-2348. The examiner can normally be reached on Mon. & Fri. 10:00-6:00 and Tue. & Thur. 10:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Juliana Kang
March 25, 2004